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ABSTRACT

Conducted to determine which, if any, variables tend to indicate potential success (operationally defined as completing the training program), an analysis examined pre-center characteristics and demographic variables of participants and attempted to apply that data to success in negotiating the Mountain Plains program, a residential, family-based education program developed to improve the economic potential and lifestyle of selected student families in a six-state area. The analysis employed a regression statistic applied to forty-three pre-center variables. The results indicated that the pre-center variables provided little or no insight in the ability to predict program completion. (Author/BM)

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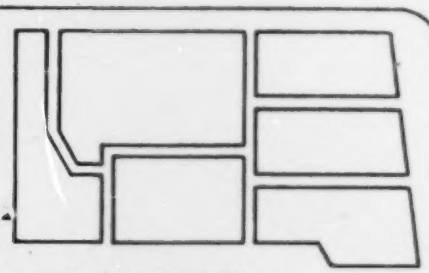

A REGIONAL PROGRAM IN
COMPREHENSIVE FAMILY EDUCATION

ED150371

REGRESSION ANALYSIS OF PRE-CENTER DEMOGRAPHIC VARIABLES: CAN BIOGRAPHIC VARIABLES BE USED TO PREDICT SUCCESS AT MOUNTAIN-PLAINS?

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
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MOUNTAIN-PLAINS EDUCATION ECONOMIC DEVELOPMENT PROGRAM INC.

REGRESSION ANALYSIS OF PRE-CENTER DEMOGRAPHIC VARIABLES: CAN BIOGRAPHIC VARIABLES BE USED TO PREDICT SUCCESS AT MOUNTAIN-PLAINS?

Author:

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April 1976

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David A. Coyle, Director

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ABSTRACT

The research attempts to predict success at Mountain-Plains, operationally defined as completing the training program, through the use or pre-center characteristics/ demographic variables. The purpose of such research is to allow the state office staff to discover which, if any, variables tend to indicate potential success at the program. The analysis employed the regression statistic applied to 43 pre-center variables. The results found pre-center variables to provide little or no insight in the ability to predict program completion.

Regression Analysis of Pre-Center Demographic Variables
Can Biographic Variables be Used to Predict Success at MP?

INTRODUCTION

The use of biographical data to predict success in school or college or on-the-job has been established as a useful method of forecasting the future for various individuals/populations. The success of such attempts has been to a large degree dependent on the type of predictions and the level of accuracy desired in those predictions. More recently the direction of this analysis has been to predict, with a reasonable degree of confidence, job success from historical biographic data concerning the individuals' family background (Richardson, Bellow, Henry and Co., January, 1975).

The purpose of this paper is to examine demographic data of Mountain-Plains students and attempt to apply that data to success in negotiating the Mountain-Plains Program. The result of this type of analysis might better enable the Mountain-Plains state office staff to select families who can negotiate the program with a high degree of success. This information would also be useful in Mountain-Plains' continuing effort to improve the program and better address the needs of the disadvantaged population which it serves. The obvious disadvantaged population which it serves. The obvious disadvantages of this type of analysis would be to apply such knowledge (that is, knowing with a high degree of confidence who will or who will not complete the program) with a tendency to select solely on those criteria. This should be avoided if at all possible (due in part to the low results to be discussed later in this text).

METHODOLOGY

Design. A step-wise regression was performed (using the SPSS canned program, Nie, et al., 1970) on a total of 43 independent variables. It is worth noting that no clustering was attempted due to the pilot nature of this research. The dependent variable was completion status with adjustments made to create a larger degree of variance to be present. A value was assigned to the different levels of completion. For married students, the value assigned Category A equalled 200; Category B equalled 100; Category C equalled 100 for HOH completing and spouse non-completing, and Category C equalled 50 for spouse completing and HOH non-completing; and Category D equalled 0. Single heads of household who completed were assigned a value of 150. Those who did not complete were given a value of 0. Although the assignment of weighted values was done somewhat arbitrarily, it was felt that such a distribution would better reflect any inherent differences within the population sample.

Sample. The population which was sampled is composed of rural disadvantaged families who experienced the Mountain-Plains Program from its inception until August, 1975, totalling in number approximately 1,000 families. The distribution of completer versus non-completer was near 65% completers. (For a comprehensive overview of pre-center demographic characteristics see Myers and Honrud, 1974.)

RESULTS

Applying all 43 variables in a step-wise regression resulted in a total of 16.8% of the variance (within completion status) being accountable. Using the .10 level of significance, analysis of variance resulted in a significant F ratio score for the combination of 9 variables. Those include: 1) Does the family own/rent/live with friends or relatives, 2) Number of states lived in in the past five years, 3) Is the HOH disabled, 4) WRAT reading score for spouse, 5) Does the family subscribe to a newspaper, 6) Is the spouse employed full-time or part-time, 7) Education completed by the HOH, 8) Value of government subsidy, and 9) Is the spouse employed. The F ratio for this grouping was 1.751 with 9DF regression and 110DF residual. The amount of variance accounted for was 12.5%.

Examining the variables independently resulted in three variables making significant, individual contributions. The three significant variables were the first three listed above ("Own/rent/live in," through "Is HOH disabled"). The R^2 value at this point equalled 6.8% of the total variance. The summary table with analysis of variance is depicted below.

Summary Table

Variable	Multiple R	R Square	R Sq. Change
Family own/rent/live in	.16020	.02566	.02566
Number states lived in	.21812	.04757	.02191
HOH disabled	.26014	.06767	.02010
WRAT Reading, spouse	.28406	.08069	.01302
Newspaper subscription	.30507	.09307	.01238
Full or Part-time, spouse	.32226	.10385	.01079
Education HOH	.33607	.11294	.00909
Value of housing subsidy	.34677	.12025	.00731
Spouse employed	.35396	.12529	.00504

Analysis of Variance

	DF	F Ratio
Regression	9	
Residuals	110	1.75069

Multiple R	.35396
R Square	.12529
Standard Error	79.63182

DISCUSSION

The low level of significance (.10) at which this data could be interpreted tends to greatly increase the probability of type II error in the results. The extremely small amount of variance accounted for also makes the usability of the results almost negligible. Due to the large number of variables examined, a statistical significance was found; although this significance was statistical in nature, in practicality, it is of little use for program development.

The pilot nature of this study did not allow for refinements to be made within the population, and changes within the program itself have been many and varied since the inception of the program; thus the population examined may not be representative of the students who are completing today. An examination of the completion/non-completion during the stability mode may result in a much more useful set of significant variables.

FORMATIVE IMPLICATIONS

This analysis did not provide insight into the prediction of program completion as had been anticipated but rather concluded that demographic variables were of little use for this purpose. Earlier reports found that demographic as well as psychological profiles could be used to predict income increases (Conrad et al., 1975, Myers et al., 1975) once a student leaves the program, thus the hope that prediction of completion status could also be obtained in a similar fashion.

The analysis design used a step-wise multiple regression procedure which may not be appropriate for the type of variables being considered. Other statistical technicques may be more appropriate to achieve the desired results. It is felt to be advantageous to explore the other processes of analysis as this knowledge would be extremely useful for state office staff as well as on-center staff.

References Cited

Nie, N.H., Bent, D.H., and Hull, C.H. Statistical Package for the Social Sciences (SPSS). New York: McGraw-Hill, Inc., 1970.

Conrad, R.W., Myers, D.D., and Coyle, D.A. Work and Income: A Follow-up Study of Career Education Model IV Students. Glasgow, Montana: Mountain-Plains Press, April, 1975. (ERIC ED 110-610)

Myers, D.D., Conrad, R.W., and Coyle, D.A. Social and Self Development: A Follow-up Study of Career Education Model IV Students. Glasgow, Montana: Mountain-Plains Press, August, 1975.

Richardson, Bellows, Henry & Co., Inc. "A Report on Predicting Job Tenure Among ES Applicants and Completion of Job Entry Among WIN Enrollees Through the Use of Biographical Information." January, 1975.

Myers, D.D., and Honrud, D. Pre-Center Characteristics of Student Families. Glasgow, Montana: Mountain-Plains Press, September - October, 1974. (ERIC CE 003 091)

APPENDICES

Variable List
Correlation Matrix of Variables Examined

Variables Examined

A complete listing of all variables entered into the analysis follows:

1. Sex of Head of Household.
2. Education of HOH.
3. Marital Status.
4. Number of persons per household.
5. State of Origin.
6. Is HOH disabled?
7. Ethnicity.
8. Education of spouse.
9. Vocational training for HOH.
10. Vocational training for spouse.
11. Salary of last job for HOH.
12. Full/part time employment for HOH.
13. Salary of last job for spouse.
14. Full/part time for spouse.
15. Was HOH employed at application?
16. Was HOH looking for employment at application?
17. Number of weeks unemployed for HOH.
18. Was spouse employed.
19. Was spouse looking for work.
20. Number of weeks spouse was unemployed in last year.
21. Total family income from employment for the last year.
22. Total amount of AFDC during last year.

23. Total amount of debts payable in the next year.

24. Does the family have a savings account?

25. Does the family have medical insurance?

26. Does the family use a budget?

27. Did the HOH vote in the last election?

28. Did the spouse vote in the last election?

29. Does the family participate in family recreation activities?

30. Does the family own/rent/live with friends or relatives?

31. Does the family live in government subsidized housing?

32. Value of government subsidy.

33. What is the family's monthly housing payment?

34. What is the family's monthly utility payment?

35. Do any children over the age of five sleep in the same room as the parent?

36. Does the family have a telephone?

37. Number of states the family has lived in during the past five years.

38. Does the family subscribe to a newspaper?

39. Does the family have a regular doctor?

40. HOH WRAT math score.

41. HOH WRAT reading score.

42. Spouse WRAT math score.

43. Spouse WRAT reading score.

	Sex HOH	Educ. HOH	Marital Status	No. Persons in Home	State Origin	HOH Disable	Ethnicity	Educ. Spouse	HOH Voc. Training	Spouse Voc. Training	Sal. Job 1 HOH	Full/Pt. HOH	Sal. Job 1 Spouse	Full/Pt. Spouse	HOH Emp.	HOH Looking	Weekly Unemp. HOH	Spouse Emp.	Spouse Looking	Weekly Spouse Unemployed
1. Sex HOH	1.00																			
2. Educ. HOH	.113	1.00																		
3. Marital Status	.860*	.118	1.00																	
4. No. Persons in Home	-.163	-.174	-.139	1.00																
5. State Origin	.050	.007	.019	-.040	1.00															
6. HOH Disable	.011	.057	.006	.015	-.033	1.00														
7. Ethnicity	-.016	-.005	-.019	-.031	.036	.009	1.00													
8. Educ. Spouse	.014	.184	N.A.	-.108	.002	.048	-.042	1.00												
9. HOH Voc. Training	.009	-.001	.003	-.071	.093	-.021	.013	.020	1.00											
10. Spouse Voc. Training	.034	-.048	.016	-.018	.038	-.043	.017	-.089	-.118	1.00										
11. Sal. Job 1 HOH	-.317*	.040	-.325*	.110	-.096	-.028	.054	.001	-.024	-.019	1.00									
12. Full/Pt. HOH	.097	.022	.097	-.002	-.005	.010	-.004	-.047	-.000	.012	-.156	1.00								
13. Sal. Job 1 Spouse	.[illegible]	.057	N.A.	-.053	-.098	.080	-.083	.076	.019	.014	.098	.029	1.00							
14. Full/Pt. Spouse	-.06[illegible]	-.034	N.A.	.051	.030	-.101	.080	-.055	.083	.077	.006	.001	-.285*	1.00						
15. HOH Emp.	.048	-.048	.035	-.029	-.046	-.048	.044	-.018	-.006	.045	.109	-.069	.019	-.015	1.00					
16. HOH Looking	.195*	.044	.159	.054	.053	-.021	-.030	-.018	-.036	-.010	-.057	.035	.026	.025	-.501*	1.00				
17. Weekly Unemp. HOH	.264*	-.038	.229*	.015	-.103	-.088	.004	-.017	-.024	.029	-.083	.085	.001	.071	.385*	-.027	1.00			
18. Spouse Emp.	-.038	.014	N.A.	.107	-.039	-.017	-.026	-.105	-.012	.029	.027	.013	-.057	-.104	.069	.035	.017	1.00		
19. Spouse Looking	.017	-.059	N.A.	.129	.004	.025	-.087	.052	.003	.080	.045	.009	-.059	.027	-.126	.156	-.091	-.092	1.00	
20. Weekly Spouse Unemp.	-.053	-.078	-.073	.191	-.029	-.031	-.009	-.145	.002	.099	.010	-.056	-.148	-.004	.040	.043	.056	.541*	.137	1.00
21. Total Family Income	-.346*	.044	-.340*	.109	.007	-.001	.005	.036	-.049	-.061	.343*	-.115	.117	-.109	-.219*	.064	-.522*	-.110	.080	-.178
22. Amount AFDC	.316*	-.034	.346*	.146	-.030	-.019	-.016	-.097	-.041	-.088	-.147	.103	-.028	-.019	.071	.121	.188	.004	.085	.013
23. $ Debts	-.205*	.072	-.193	.058	-.009	.038	-.046	.050	-.005	-.094	.201*	-.112	.138	-.080	-.102	.001	-.215*	-.002	-.075	-.026
24. Savings	-.031	.136	-.050	-.115	-.013	.015	-.021	.051	.026	-.091	.123	.019	.126	.054	-.139	.[illegible]12	-.076*	-.105	.033	-.169
25. Medical Insurance	.016	-.140	-.002	.001	-.062	-.085	.021	-.045	-.039	-.019	-.121	.075	-.151	.038	.204*	-.132	.101	.153	.109	.141
26. Budget	-.057	-.123	-.085	.010	.034	-.003	-.020	-.062	-.022	.011	-.031	.028	-.111	.017	.084	-.040	.033	.032	-.031	.084
27. HOH Vote	-.066	-.126	-.084	-.086	-.023	.005	-.061	-.029	.038	.009	-.011	-.009	.017	.060	.053	.000	.019	-.033	-.017	.025
28. Spouse Vote	.021	-.065	.029	-.142	.028	-.083	.092	-.073	.043	.077	-.079	-.052	-.041	-.033	.009	.030	-.004	-.011	-.027	.048
29. Family Rec.	.001	-.016	.024	.024	-.063	-.021	-.025	-.018	.068	.045	-.066	.059	.056	-.029	-.039	.018	.022	-.053	.010	.013
30. Own/Rent/Live	.037	-.026	.013	-.223	-.019	.044	.025	-.049	-.020	.100	-.133	.050	-.010	.019	.116	-.095	.043	.084	-.030	.045
31. Subsidy	-.067	.018	-.003	-.078	.032	-.027	.024	-.022	.020	.109	-.017	-.036	.044	.017	.058	-.086	.038	-.028	.002	-.037
32. Val. Sub.	.110	-.039	.106	.148	.116	.101	-.026	.064	.033	-.128	-.077	.014	-.077	-.065	-.015	.030	.056	.032	.098	.093
33. House Payment	.042	.072	.043	.043	.068	-.045	-.024	.075	-.017	-.005	.099	-.038	.030	-.103	-.114	.053	-.109	-.125	.050	-.104
34. Utility	.017	.021	.023	.314	-.093	.046	-.005	.061	-.022	-.058	.112	.027	.075	-.093	-.031	.109	-.016	-.022	.054	-.068
35. Kid Over 5	-.180	.028	-.179	.014	.086	.008	-.000	.084	-.015	.004	.082	-.020	.007	-.095	-.042	.016	-.097	-.061	-.063	-.023
36. Telephone	-.1[illegible]	-.138	-.159	.059	-.112	.001	-.007	-.109	-.074	.065	-.044	.032	-.076	.015	.087	-.122	.111	.065	-.022	.087
37. No. States Lived In	-.009	-.093	.014	.000	-.072	-.009	.007	-.034	-.013	-.017	.058	-.017	.015	-.049	.045	-.079	.052	.029	-.032	.085
38. Newspaper	-.085	-.067	-.098	-.108	-.061	-.031	.027	-.014	.009	.036	.006	-.054	.117	.024	.089	-.085	.040	.079	-.020	.062
39. Doctor	-.085	-.046	-.092	-.032	-.020	-.021	.004	-.003	-.030	.029	.042	.103	.079	-.015	.105	-.046	.080	.029	-.102	.057
40. WRAT Math HOH	.070	.296*	.035	-.064	-.044	-.012	.059	-.046	-.003	-.002	.014	.039	.008	-.019	-.013	.062	.014	.047	.008	.033
41. WRAT Read HOH	.118	.380*	.143	-.037	.169	.034	.039	.036	.007	.051	-.066	.011	.060	-.031	-.072	.012	.016	.033	.017	.021
42. WRAT Math Spouse	.047	.105	-.133	-.095	-.019	.035	.089	.189	-.085	-.041	.070	-.033	.056	-.002	-.044	-.018	-.064	-.075	.015	-.129
43. WRAT Read Spouse	-.015	.129	-.111	-.066	.101	.026	.027	.105	.017	-.011	.044	-.016	-.035	.001	-.015	-.095	-.115	-.026	-.059	-.013
44. Completion Status	.008	.138	.040	.051	.040	.136	.018	.052	-.014	-.052	-.031	.006	-.066	.091	-.086	.032	-.063	.034	.044	.004

*Probability less than .05.

	Total Family Income	Amount AFDC	$ Debts	Savings	Medical Insurance	Budget	HOH Vote	Spouse Vote	Family Rec.	Own/Rent/ Live	Subsidy	Val. Sub.	House Payment	Utility	Kid Over 5	Telephone	No. States Lived In	Newspaper	Doctor	WRAT Math HOH	WRAT Read HOH	WRAT Math Spouse	WRAT Read Spouse	Completion Status
21.	1.00																							
22.	-.226*	1.00																						
23.	.313*	-.122	1.00																					
24.	.134	-.060	.058	1.00																				
25.	-.173	.095	-.095	-.177	1.00																			
26.	-.049	-.036	-.076	-.149	.098	1.00																		
27.	-.032	-.022	.011	-.102	.106	.101	1.00																	
28.	-.102	-.042	.024	-.110	.146	.082	.604*	1.00																
29.	-.018	.108	-.103	-.020	-.023	-.001	.058	-.056	1.00															
30.	-.208*	-.046	-.165	-.064	.136	.144	.170	.110	.010	1.00														
31.	.014	-.105	.026	-.018	.018	.064	.033	.014	-.005	.092	1.00													
32.	-.060	.309*	-.043	-.011	-.066	-.103	-.248*	-.342*	.025	-.192	-.613*	1.00												
33.	.203*	.045	.130	.077	-.033	-.147	-.079	-.035	.009	-.452*	-.070	.190	1.00											
34.	.095	.126	.079	.057	-.078	-.096	-.118	-.017	.025	-.423*	-.064	.067	.221*	1.00										
35.	.120	-.013	.091	.088	-.028	-.062	-.010	-.027	.014	-.048	-.062	.063	.027	.059	1.00									
36.	-.138	-.082	-.118	-.118	.128	.070	.102	.114	.039	-.083	-.021	-.072	-.037	-.043	-.062	1.00								
37.	-.002	-.017	-.026	-.025	.065	-.032	.058	.049	-.023	.009	.105	-.129	.018	.071	.001	.015	1.00							
38.	-.055	-.092	.023	-.009	.068	.058	.061	.104	.035	-.011	.011	.017	-.072	-.072	-.086	.227*	.037	1.00						
39.	-.076	-.047	-.155	-.072	.111	.153	.051	.017	-.009	.145	.048	-.109	-.051	-.152	-.024	.191	.060	.067	1.00					
40.	.076	.002	.027	.027	-.012	.036	-.048	-.032	-.088	-.077	-.041	.067	.133	-.036	.028	-.090	-.016	.007	.014	1.00				
41.	.048	-.009	-.012	.058	-.091	-.031	-.100	-.023	-.134	-.050	.013	.048	.083	-.005	-.025	-.127	.053	-.056	.017	.428*	1.00			
42.	.136	-.074	.006	.146	-.097	-.073	.057	-.079	-.055	-.028	-.012	-.028	.106	-.026	-.031	-.016	.040	.014	-.037	.298*	.143	1.00		
43.	.097	-.073	-.008	.030	-.050	-.097	.009	-.025	.038	-.064	.017	.016	.086	-.039	.015	-.060	.002	.015	-.004	.137	.260*	.270*	1.00	
44.	.095	.043	.022	.046	-.108	-.003	-.057	-.130	.002	-.160	-.059	.133	.091	.097	.084	-.087	-.150	-.117	-.077	.103	.080	.028	.128	1.00